

QUERY CONTROL FORM		RTIS USE ONLY	
Application No. <u>09601319</u>	Prepared by <u>CA</u>	Tracking Number <u>0600 7972</u>	
Examiner-GAU <u>Donovan -2832</u>	Date _____	Week Date <u>9/6/04</u>	
	No. of queries _____		

JACKET			
a. Serial No.	f. Foreign Priority	k. Print Claim(s)	<input checked="" type="checkbox"/> p. PTO-1449
b. Applicant(s)	g. Disclaimer	l. Print Fig.	q. PTOL-85b
c. Continuing Data	h. Microfiche Appendix	m. Searched Column	r. Abstract
d. PCT	i. Title	n. PTO-270/328	s. Sheets/Figs
e. Domestic Priority	j. Claims Allowed	o. PTO-892	t. Other

SPECIFICATION	MESSAGE
a. Page Missing	<p>① PTO 1449: please initial / line through citations dated 11-25-02 Copies provided for reference.</p> <p>② Amendment: Insert B.1) appears to be inserted for Claim 2 instead of Claim 1. please resolve.</p>
b. Text Continuity	
c. Holes through Data	
d. Other Missing Text	
e. Illegible Text	
f. Duplicate Text	
g. Brief Description	
h. Sequence Listing	
i. Appendix	
j. Amendments	
k. Other	
<p>CLAIMS</p> <p>a. Claim(s) Missing</p> <p>b. Improper Dependency</p> <p>c. Duplicate Numbers</p> <p>d. Incorrect Numbering</p> <p>e. Index Disagrees</p> <p>f. Punctuation</p> <p><input checked="" type="checkbox"/> g. Amendments</p> <p>h. Bracketing</p> <p>i. Missing Text</p> <p>j. Duplicate Text</p> <p>k. Other</p>	
<p>RESPONSE</p> <p>initials <u>CA</u></p> <p>initials</p>	

**IN THE CLAIMS:**

Please amend claims 1, 3, 8 and 10 as follows. Claims 1, 3, 8 and 10 are presented below in their amended form. The amendments to the above-noted claims are outlined in an Attachment to the Amendment using the conventional indication method of bracketing and underlining.

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B12  
#3

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1. (Amended) An electromagnetic actuator having a coil on which current is applied, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is applied and a vibration plate that vibrates by magnetic action when a low-frequency current is applied, with the coil positioned within the magnetic gap and the coil, the magnet, the magnet yoke, the diaphragm, and the vibration plate are accommodated in a basket, in which the magnet is radially arrayed and positioned with its north and south poles parallel to the diaphragm and the vibration plate.

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A4

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3. (Amended) An electromagnetic actuator as described in claim 1 or 2 above, in which a cover of the basket is used as magnetic shielding.

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A5

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8. (Amended) An electromagnetic actuator having a coil on which current is applied, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is applied and a vibration plate that vibrates by magnetic action when a low-frequency current is applied with the coil positioned within the magnetic gap and the coil, the magnet, the magnet yoke, the diaphragm, and the vibration plate are accommodated in a basket, in which the vibration plate, is supported within the basket by an elastic piece that presses against the surface of an outer rim of the vibration plate.

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A6

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10. (Amended) An electromagnetic actuator having a coil on which current is applied, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a

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ORIGINALLY FILED

Docket No. 0675-0030

#17  
Andy B  
J. White  
G. R. DL

In re Patent Application of )  
Tsuneo KYOUNO et al. )  
Serial No. 09/601,319 )  
Filed: October 23, 2000 )  
For: ELECTROMAGNETIC )  
ACTUATOR AND STRUCTURE )  
FOR MOUNTING THE SAME )

Art Unit: 2832

Examiner: L. Donovan

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Washington, D.C. 20231, on 8/24/02

**PRELIMINARY AMENDMENT**

Honorable Commissioner of Patents  
Washington, D.C. 20231

Sir:

In response to the Office Action dated February 21, 2002 please amend the  
above-identified application as follows:

**IN THE CLAIMS:**

Please cancel claim 3 and amend claims 1 and 2 as follows:

1. (Twice Amended) An electromagnetic actuator having a coil on which  
current is applied, a magnet that forms a magnetic circuit between its poles across a  
magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a  
high-frequency current is applied and a vibration plate that vibrates by magnetic action  
when a low-frequency current is applied, with the coil positioned within the magnetic  
gap and the coil, the magnet, the magnet yoke, the diaphragm, and the vibration plate  
are accommodated in a basket in which the magnet is formed in a ring shape, and the  
magnet is magnetized with a south pole located at one of an outer or inner periphery of  
the ring shape magnet and a north pole located at the other of an inner or outer

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periphery of the ring shape magnet, and the ring shape magnet is radially arrayed and positioned with an axis of its north and south poles parallel to the diaphragm and the vibration plate.

2. (Amended) An electromagnetic actuator as described in claim 1 above, in which the magnet and the magnet yoke have two vibration plates and the two vibration plates are fixed inside the basket, and the magnet and the magnet yoke are supported by the two vibration plates in the basket, and the two vibration plates providing a double-suspension structure.

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#20K  
T. BELL  
6-11-03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of ) Art Unit: 2832  
Tsuneo KYOUNO et al. ) Examiner: L. Donovan  
Serial No. 09/601,319 )  
Filed: October 23, 2000 )  
For: ELECTROMAGNETIC )  
ACTUATOR AND STRUCTURE )  
FOR MOUNTING THE SAME )

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*Adelle M. Sturges*

AMENDMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated December 3, 2002, please amend above-identified application as follows:

IN THE CLAIMS:

Please amend claim 1 as follows:

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1. An electromagnetic actuator having a coil on which current is applied, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is applied and a vibration plate that vibrates by magnetic action when a low-frequency current is applied, with the coil positioned within the magnetic gap and the coil, the magnet, the magnet yoke, the diaphragm, and the vibration plate are accommodated in a basket in which the magnet is divided into at least two pieces and is formed in a ring shape, and the magnet yoke is assembled with a spacer between the magnet yoke and the magnet, and the magnet is magnetized with a south pole

*CI  
contd*

located at one of an outer or inner periphery of the ring shape magnet and a north pole located at the other of an inner or outer periphery of the ring shape magnet, and the ring shape magnet is radially arrayed and positioned with an axis of its north and south poles parallel to the diaphragm and the vibration plate.

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WHAT IS CLAIMED IS:

1. An electromagnetic actuator having a coil on which current is impressed, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is impressed and a vibration plate that vibrates by magnetic action when a low-frequency current is impressed, with the coil positioned within the magnetic gap and the parts thereof being accommodated in a basket, in which the magnet is radially arrayed and positioned with its north and south poles parallel to the diaphragm and the vibration plate.

2. An electromagnetic actuator as described in claim 1 above, in which there are two vibration plates with the magnet between them, the two vibration plates providing a double-suspension structure.

3. An electromagnetic actuator as described in claim 1 or 2 above, in which the cover of the basket is used as magnetic shielding.

4. An electromagnetic actuator having a coil on which current is impressed, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is impressed and a vibration plate that vibrates by magnetic action when a low-frequency current is impressed, with the coil positioned within the magnetic gap and the parts thereof being accommodated in a basket, in which the vibration plates are made of a stainless steel or alloy of copper and titanium that does not require an aging/hardening process after being formed.

5. An electromagnetic actuator having a coil on which current is impressed, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action

when a high-frequency current is impressed and a vibration plate that vibrates by magnetic action when a low-frequency current is impressed, with the coil positioned within the magnetic gap and the parts thereof being accommodated in a basket, in which the basket has a thin bottom plate that also serves as a vibration plate.

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6. An electromagnetic actuator as described in claim 5 above, in which the basket has a thin bottom plate with at least one lip that is concentric with the plate.

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7. An electromagnetic actuator as described in claim 5 or 6 above, in which the basket has a thin bottom plate formed of a material chosen from among polyethylene terephthalate (PET), polyethyl imide (PEI) or polyimide (PI).

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8. An electromagnetic actuator having a coil on which current is impressed, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is impressed and a vibration plate that vibrates by magnetic action when a low-frequency current is impressed, with the coil positioned within the magnetic gap and the parts thereof being accommodated in a basket, in which the vibration plate is supported within the basket by an elastic piece that presses against the surface of the outer rim of the vibration plate.

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9. An electromagnetic actuator as described in claim 8 above, in which the magnet yoke is supported by the vibration plate and the elastic piece has an inward protrusion that is positioned close to the outer edge of the magnet yoke.

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10. An electromagnetic actuator having a coil on which current is impressed, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is impressed and a vibration plate that vibrates by



magnetic action when a low-frequency current is impressed, with the coil positioned within the magnetic gap and the parts thereof being accommodated in a basket, in which the coil is supported by a concentric projection that projects from the surface of the vibrating portion, and there is a diaphragm within the basket.

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11. An electromagnetic actuator having a coil on which current is impressed, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is impressed and a vibration plate that vibrates by magnetic action when a low-frequency current is impressed, with the coil positioned within the magnetic gap and the parts thereof being accommodated in a basket, in which the coil is supported by a concentric projection that projects from the diaphragm, and the coil and diaphragm are assembled in a single unit.

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12. An electromagnetic actuator having a coil on which current is impressed, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is impressed and a vibration plate that vibrates by magnetic action when a low-frequency current is impressed, with the coil positioned within the magnetic gap and the parts thereof being accommodated in a basket, in which the magnet is held in a magnet yoke and the magnet yoke holding the magnet is supported by the surface of the vibration plate, and the magnet, magnet yoke and vibration plate are assembled in a single unit.

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13. An electromagnetic actuator mounting structure for mounting an electromagnetic actuator inside portable electronic equipment in which elastic packing is sandwiched between the inner surface of the equipment case and the basket of the electromagnetic actuator and between the basket of the electromagnetic actuator and the electromagnetic actuator mounting substrate, so that the electromagnetic actuator is mounted inside the portable electronic equipment.

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14. An electromagnetic actuator mounting structure as described in claim 13 above, in which the elastic packing is fitted to the bottom of the basket, and is sandwiched between the basket of the electromagnetic actuator and the mounting substrate.

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet

**1**

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Attorney Docket Number

0675-0030

**Complete if Known**

Application Number

09/601,319

**Filing Date**

October 23, 2000

**First Named Inventor**

Tsuneo KYOUNO et al.

**Group Art Unit**

2832

Examiner Name \_\_\_\_\_

L. Donovan

Attorney Docket Number

0675-0030

## U.S. PATENT DOCUMENTS

[illegible]

## FOREIGN PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS								
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>2</sup>
		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				
	•	JP	09-070571			03/18/1997		Abstract
	•	JP	08-238901			09/17/1996		Abstract
	•	JP	09-027994			01/28/1997		Abstract
	•	JP	06-120866			04/28/1994		Abstract
	•	JP	08-179061			07/12/1996		Abstract

#### OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		International Preliminary Examination Report dated May 2, 2000.	Full

Examiner Signature		Date Considered	
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<sup>1</sup> Unique citation designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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